

UGANDA PROTECTORATE.

ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

THE YEAR ENDED 31st MARCH, 1913.

Published by Command of His Excellency the Governor



KAMPALA :

PRINTED BY THE UGANDA COMPANY PRESS.

1913.

.. STAFF ..

Director of Agriculture :—S. SIMPSON, B.Sc., etc.

District Agricultural Officers.

E. T. BRUCE

R. G. HARPER.

L. E. KNOLLYS. (*Until Feb. 2nd.*)

L. HEWETT.

A. R. MORGAN.

T. D. MAITLAND. (*From March 6th.*)

Assistant District Agricultural Officer :—J. D. SNOWDEN.

Ploughing Instructor :—G. W. McNEIL.

BIOLOGICAL DIVISION.

Entomologist :—C. C. GOWDEY, B.Sc., F.E.S., F.Z.S.

Botanist :—WM. SMALL, M.A., B.Sc. (*from Feb. 5th.*)

VETERINARY DIVISION.

Chief Veterinary Officer :—E. HUTCHINS, M.R.C.V.S.

Veterinary Officers.

U. F. RICHARDSON, M.R.C.V.S.

E. H. BROGAN, M.R.C.V.S.

J. D. BROOME, M.R.C.V.S. (*Until Sept. 24th.*)

Stock Inspectors.

H. A. STRAUSS.

J. GRIERSON (*Until March 28th.*)

Indian Veterinary Assistants.

H. RAHMATULLAH.

N. ULLAH KHAN.

CLERICAL STAFF.

Clerks.

J. A. M. D'SA.

V. P. DE XERAFINS.

J. X. D'MELLO.

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ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE

For the Year ended 31st March, 1913

DEPARTMENT OF AGRICULTURE

Kampala, Uganda,

May, 1913.

1. The past year has been another one of steady progress and expansion in the agricultural interests of the country.

The price of land has risen enormously, due to the large influx of European planters anxious to take up land, so that land valued at Rs. 4/- per acre last year easily finds a purchaser now at Rs. 20/- per acre or even more.

All the crops of the country have done well, and transport facilities are being rapidly pushed forward.

Developments are to be reported in every direction, whilst work is somewhat concentrated near adequate transport facilities. Attention is given to a large number of different crops suited to the diverse conditions prevailing in the country with a view to the expansion being guided along lines which are sound both from the agricultural standpoint and solid economic development.

COTTON.

2. This is the most important crop of the country and it is estimated that 50,000 acres are now grown. Last year the cotton exports exclusive of seed were valued at over a quarter of a million sterling, so a substantial foundation has already been laid for making of a really good and profitable industry. The demand for seed for next season's sowing has been enormous, and the crop is becoming very popular with the natives. This is purely a native industry, and the large exports are due entirely to the thousands of small cultivators throughout the country.

In the past, the cotton has been disgracefully handled after leaving the hands of the growers owing to lack of transport facilities, storage accommodation, and the absence of ginneries in the cotton growing districts. Improvements are gradually being made in the right directions, but much yet remains to be done before facilities for dealing with the crop are in any way commensurate with the value and quality of Uganda cotton.

Eastern Province.

3. This province grows by far the largest portion of the cotton crop and cotton buyers should concentrate upon it at the beginning of the season as the crop is earlier there than in Buganda Province. Complete arrangements should be made for buying the cotton by the end of October with an ample supply of money and bags available at the various centres, so that the operation of moving the crop may be started as soon as possible.

In the Busoga, Bukedi and Lango districts a largely increased amount of cotton seed has been distributed, whilst the increased demands from Teso have been unprecedented.

The estimated crop in Busoga this year was 2,000 tons, and in Bukedi 740 tons were sold, whilst Lango produced 190 tons. The production in Teso was 2,874 tons, and further details with reference to this district are given below.

Last year, Bukedi suffered severely from lack of transport facilities, consequently the crop was sold at ridiculously low prices, and there was therefore no incentive to grow cotton this season. However, Bukedi hopes to treble this season's output next year, and Lango and Teso districts can be confidently expected to more than double the present season's crop.

Teso District.

4. In this district, the following quantities of seed cotton were sold in the various markets last season :—Bugondo 695 tons, Kumi 685 tons, Kidongole 441 tons, Ngora 264 tons, Lalle 250 tons, Kyere 140 tons, Kokolyo 125 tons, Chulu 110 tons, Sambwe 88 tons, Kojitinyang 41 tons, and Magoro 35 tons, making a total of 2,874 tons for the district.

It is estimated that 52,000 plots of cotton were sown to produce the above results and that the native growers received over £30,000 for the crop in this district alone.

In the Serere County of this district the cotton was bought by actual ginners only, and the following table gives the quantities bought by each firm operating there :—

Buyer	Bugondo	Kyere	Sambwe	Kojitinyang	Total
	tons	tons	tons	tons	tons
Uganda Co., Ltd.	325	-	57	-	382
B. E. A. C., Ltd.	262	72	7	6	347
U. C. B. & G. Co., Ltd.	32	51	22	31	136
B. C. T. Co., Ltd.	62	17	2	4	85
Mr. Allidina Visram	14	-	-	-	14
Total at each place	695	140	88	41	964

THE TABLE BELOW SHOWS THE AREA AND YIELD OF SEED COTTON IN THE TESO DISTRICT IN 1912-13

County	Cotton markets	Estimated area of cotton	Quantity of cotton sold	Estimated average yield of seed cotton per acre
		acres	tons	lbs
Kumi	Kumi	4,700	685	480
	Ngora		264	
Bukedea	Kidongole	1,800	441	
Soroti	Lalle	2,600	250	310
	Chulu		110	
Usuku	Kokolyo	1,400	125	256
	Magoro		35	
Serere	Bugondo	3,500	695	617
	Kyere		140	
	Sambwe		88	
	Kojitinyang		41	
Total		14,000	2,874	

The general average production of seed cotton per acre in the district was 460 lbs, which figure is much below that which can reasonably be expected in an average season.

In Soroti and Usuku counties the seed was distributed late. These counties possess a light free-working soil, so that the long drought experienced in December and January reduced the yield far more than it could possibly have done under normal conditions of seed distribution.

Buganda Province.

5. This season's crop will probably fall short of last year's, although accurate figures are unobtainable.

More seed has been distributed for next season in this province than ever before, particularly in the Bulemezi and Buruli counties where cotton grows really well.

There is ample opportunity for working a small cotton ginnery north of Bombo which would relieve a large number of porters now occupied in carrying the cotton crop to Kampala.

Other Provinces

6. Very little cotton is grown in the Western Province, because transport difficulties are practically unsurmountable with such a crop. Progress is far more satisfactory in the Northern Province, and when local ginneries are established, cotton growing should make rapid strides in the Northern Province.

THE COTTON SEASON

7. This was in some respects a disappointing one. The season began well. In Teso the sowing was done under very favourable conditions. Rains were plentiful throughout the season, but in August a series of rain-storms and cold nights gave the crop a set-back.

This was made good in September and October, and all would have been well if moderate rains had fallen in November and December, but a drought started in December and continued to the middle of February, which brought the picking season to an abrupt end, and seriously reduced the yield from the very late planted cotton.

However, the crop was harvested in good condition and prices were uniformly good throughout the country.

HANDLING OF COTTON

8. The handling of the cotton after it leaves the hands of the growers admits of much improvement.

The growers are trained to separate the clean cotton from the stained at the time of picking, and to encourage this, buyers must discriminate in price at the time of purchase, and also gin and bale the different qualities distinct from each other. Unfortunately some of the natives still use fibre for bundling their cotton and tying the mouths of sacks. This fibre must not be permitted on any account to get into ginned cotton as it ruins the carding machinery of the spinner.

PRICE OF COTTON

9. The first 176 bales of this season's crop have been sold at 9.25d per lb., or 2.40d. above "middling" American. It will thus be seen that Uganda cotton is of good quality and therefore will well repay for care and attention in handling, ginning, and baling.

NEXT SEASON

10. Over 261 tons of seed have already been distributed for sowing purposes, which is well over 100 tons in excess of last season. More than two thirds of the total seed distribution has been in the Eastern Province

GOVERNMENT PLANTATIONS

11. There are now three plantations under the control of the Department situated in various parts of the country. They are worked by District Agricultural Officers and are the means of collecting adequate data on the agriculture of the country. These plantations are made centres of instruction, and provide means for the introduction of new crops with careful supervision under varying conditions.

Besides, the recognised products of the country are grown, and methods employed to improve them.

With the large staff of native agricultural instructors at work in the country, these plantations are utilised largely as training schools in every branch of agriculture. A separate Report on the work of each plantation is appended.

AGRICULTURAL STATISTICS

12. This year, an attempt been made to collect and tabulate the agricultural returns as fully as possible and to separate figures under the headings of Native, European, and Mission Agriculture. The figures are given in the appendices.

COFFEE

13. Great extensions have been made in the acreage under this crop chiefly as a result of the large influx of European planters. Ten years ago coffee to the value of £892 was exported, whilst last year the exports were valued at £5,940. Coffee is the most popular crop amongst the European planters, but cannot be regarded as anything but a risky crop especially as species of *Hemileia* are endemic to the country.

CACAO

14. Most of the cacao is very young, but the crop promises well. Planters are giving increased attention to this crop, so that the supply of local seed is insufficient to meet the demands.

RUBBER

15. All kinds of rubber have been tried and the area under Para is increasing rapidly and is likely to continue the favourite rubber in Uganda for planting purposes.

The tree grows slowly for two or three years, but then thickens rapidly and is fairly good at five years old.

Tapping results on the oldest trees in the country in the Botanic Gardens, Entebbe, and on the Kivuvu Estate, have proved fairly satisfactory.

TEA

16. In December, 1909, tea seed was obtained from Assam. It germinated well and the seedlings were planted on the Kampala Plantation and have made good progress. This crop is being watched with keen interest.

TOBACCO

17. The plant grows extremely well, and large quantities are grown by natives throughout the Protectorate for their own use. Experiments on a small scale are being tried in suitable places as there is no doubt that the drier zones of the country would be capable of producing tobaccos of exportable qualities.

WHEAT

18. The area under wheat makes little headway, as the transport difficulties from Toro are very great.

In the Mount Elgon region the transport question is not so serious, and with a flour mill established at Mbale the local product should find a ready market.

RICE

19. This crop is not yet a popular one and rice is still imported which could easily be grown in the country.

CHILLIES

20. The exports are still considerable, but the crop is not specially cultivated, but grows in a semi-wild condition chiefly in Busoga.

The figures show a declining interest in this crop.

GROUND-NUTS AND SIM-SIM

21. These crops are increasing in popularity. They are admirably suited to native cultivation and are being encouraged in suitable districts.

SUGAR CANE

22. This crop is grown to a small extent only throughout Buganda Province, but is worthy of attention on a larger scale.

MISCELLANEOUS NATIVE CROPS

23. Linseed has been introduced this year on the foot-hills of Mount Elgon, and has done well. The food crops such as Plantains, Sweet Potatoes, Millets, Maize, Cassava and various kinds of peas and beans call for no special comment.

BEESWAX

24. The production of this commodity makes very little headway, so the efforts put forth in connection with this industry have been directed in other channels.

PLOUGHING SCHOOLS

25. The ploughing schools have been made migratory in character and their influence is thus increased. Many of the Chiefs have purchased ploughs, and, in Teso particularly, ploughing is being taken up in earnest.

AGRICULTURAL INSTRUCTION

26. All the Government Plantations are made centres of agricultural instruction, and the various Missions are giving increased attention to this essential part of native education.

LIVE STOCK

27. The statistics showing the number of live stock in the various districts are given in the appendix No. 4. The report of the Chief Veterinary Officer is enclosed.

BOTANICAL AND MYCOLOGICAL

28. A cryptogamic Botanist was appointed towards the end of the year. Most of his time was spent investigating 'coffee leaf disease', but the time available for this work does not admit of any special report being included.

STOCKING FUNGICIDES AND INSECTICIDES

29. On recommendations by this Department, the Planters' Association have bought large quantities of the above as well as the necessary appliances.

These are to be stored and issued as required to both members and non-members, and thus ample precautions for dealing with pests of all descriptions are assured.

CONCLUSION

30. I have to thank all the members of staff for their invaluable help and co-operation during the year.

The Department comes very much into direct contact with the members of the commercial and planting interests, and the unfailing kindness and courtesy shewn by them on all occasions are very highly appreciated by all the members of the staff.

S. SIMPSON,

Director of Agriculture.

Report on the Government Plantation, Kampala.

METEOROLOGICAL STATION.

31. The rainfall for the year was satisfactory ; although it was again below the general average, it was well distributed, rain being recorded on no less than two hundred and twenty days.

The greatest fall recorded at one reading was 2.63 inches.

Hail fell on two or three occasions and resulted in some damage to crops.

COMPARATIVE STATEMENT OF RAINFALL

Months.	1909-10		1910-11		1911-12		1912-13	
	No. of days	Inches	No. of days	Inches	No. of days	Inches	No. of days	Inches
April	25	11.34	18	8.75	15	5.84	27	5.73
May	17	6.53	16	7.72	18	4.85	24	4.54
June	15	2.46	7	2.49	9	3.82	20	3.00
July	10	2.29	11	3.25	3	.20	15	2.65
August	13	6.16	7	7.71	21	5.60	18	10.39
September	12	2.77	15	8.28	19	2.84	13	1.96
October	11	2.23	11	3.00	14	.79	21	6.21
November	12	3.89	15	8.25	24	8.60	23	3.07
December	23	6.69	15	4.57	10	.57	21	5.13
January	8	6.77	8	1.13	11	3.12	8	2.37
February	5	1.13	4	.77	12	2.57	15	3.96
March	13	4.14	16	6.65	26	8.39	15	7.68
Totals	164	56.40	143	60.57	182	47.19	220	56.69

MONTHLY MEAN TEMPERATURES

Months	At 7 a.m.		At 2 p.m.		Max.	Min.	Highest	Lowest
	Dry bulb	Wet bulb	Dry bulb	Wet bulb			Max. recorded	Min. recorded
April	69.83	67.66	80.43	74.80	83.93	65.26	87	63
May	69.61	67.51	81.35	75.64	85.06	65.74	90	61
June	66.73	64.73	79.63	73.33	82.73	63.06	87	60
July	64.41	62.70	76.33	70.83	79.35	61.64	85	57
August	63.90	62.51	76.48	71.06	79.38	61.19	84	59
September	64.23	62.76	78.90	71.13	81.10	61.10	86	57
October	65.06	63.03	78.54	72.38	81.67	61.74	86	59
November	65.33	63.50	80.66	72.00	81.33	62.26	85	60
December	65.80	63.77	72.09	71.68	81.58	62.96	85	61
January	65.93	63.90	80.90	73.74	82.80	63.00	86	60
February	67.17	64.46	80.71	73.82	82.78	64.10	87	61
March	66.64	64.77	79.51	73.09	82.48	63.41	86	60

COFFEE

32. The most advanced coffee on the estate is a twelve acre plot of Arabian coffee planted out in October 1909. This plot is interplanted with Para rubber and the plants are fairly widely set, so that there are only, on an average, 380 coffee trees to the acre. During the past year, the crop from this plot worked out at a little over half a pound per tree.

The next plot is now two years old from planting out and is of the variety known as 'Bourbon' as opposed to 'Nyasaland,' which is the general variety in Uganda; both are of course Arabian coffees and the names refer to the origin of the seed, the latter having been imported into Uganda from Nyasaland, while the former was originally introduced through German East Africa by the White Fathers. The two varieties are readily distinguishable in the plant, though there appears to be little difference in the seed.

The 'Bourbon' coffee bore a small maiden crop during the year, and at the end of the year had set a heavy first crop.

The remainder of the coffee on the plantation consists of various plots of young coffee below the age of bearing.

The presence of 'coffee leaf disease' was first observed early in November. Measures were at once instituted to try to suppress it; all diseased leaves were systematically picked off and carefully burned, and the trees were repeatedly sprayed with 'Bordeaux' and 'Burgundy' mixtures. Attempts at suppressing the disease have met with no success up to the present.

During the coming year, a series of experiments will be carried out to endeavour to discover a means of preventing the spread of this pest, if not the suppression of it.

CACAO

33. An area of fifteen acres is devoted to Cacao. The oldest trees were planted out three and a half years ago, the seedlings at the time of planting being four months old.

The plantation is as yet too young to bear a crop, but during the year a few trees produced pods and a small quantity of ripe fruit was gathered.

There is a very marked difference in the progress made by individual trees—a few trees having given several pods each, whereas the majority have not yet produced any fully developed fruits.

The whole of the older Cacao is at present under the shade of plantains and has received similar treatment throughout, but it is now proposed to divide the area into plots which will receive varying treatment as regards shade and so forth.

PARA RUBBER

34. The Para rubber trees have now been planted out for three years and are three and a half years old from seed.

It will be some years before the trees attain a tappable size, but they are all in a healthy condition and have made fairly satisfactory growth during the past year.

At two years old the largest tree had a circumference of $5\frac{1}{4}$ inches at three feet above ground, and at three years the largest circumference was 10 inches. The trees vary considerably, and a large number measure between 6 and 9 inches, but the general average is only a little over 6.

CEARA RUBBER

35. There are various plots of Ceara rubber on the plantation, the oldest trees being three and a half years old.

A small amount of experimental tapping was done. The trees were tapped in groups of twenty; the average girth of the groups varied between 15 and 20 inches; the system of tapping employed was the half-herring-bone paring and pricking.

The following results were obtained:—

A group of 20 trees tapped 12 times yielded $9\frac{1}{2}$ ozs of dry rubber.

"	"	"	20	"	"	12	"	"	$6\frac{1}{2}$	"
"	"	"	20	"	"	14	"	"	10	"
"	"	"	20	"	"	13	"	"	$7\frac{1}{2}$	"
"	"	"	20	"	"	60	"	"	47	"
"	"	"	20	"	"	14	"	"	$6\frac{1}{2}$	"
"	"	"	20	"	"	10	"	"	6	"
"	"	"	20	"	"	90	"	"	45	"

THE ALLIED MANIHOTS

36. The trial plot of the allied Manihots (*M. dichotoma*, *M. Piauhensis* and *M. heptaphylla*) is not encouraging. The trees grow rapidly but every storm takes its toll, and a well grown tree is reduced to a stump and has to start growth over again. As many as twenty per cent of the trees on this plot have been broken in one short windstorm, and during the year practically every tree on the plot has suffered, many of them losing their tops several times over. It seems quite clear that these trees cannot hope to grow at all except in the most sheltered positions, and the claim that they are less liable to wind-damage than *Manihot Glaziovii*, certainly has not been upheld by the specimens we have obtained.

SISAL

37. The sisal, which is now four years old, began poling in January, and, at the end of April the plot was a forest of poles.

No use has been made of the sisal as there is no plant in Uganda to deal with it. Two large sample consignments of leaves were sent down to East Africa to a firm who kindly offered to put it through their scrutching machinery to test it, but in each case it was found that the journey was too long, and the leaf was ruined for carrying out any useful trial.

Large numbers of suckers were distributed, as the plant is being used as a hedge, more particularly as an outside boundary hedge, as, at from two to three years, it forms a very stiff fence and is almost impenetrable.

TEA

38. There are two plots of tea on the plantation. During the two years they have been growing, the plants have made good progress, and the trial will be watched with interest.

COTTON

39. Two small plots of cotton were sown. These were two of a series of plots the object of which was to make sure that the improved varieties of cotton, which had been raised in selected areas of the Eastern Province, were suited to the slightly different climate of Buganda Kingdom before introducing these varieties as the general crop of the Protectorate.

The first of these plots was sown in May and yielded 648 lbs of seed cotton to the acre: this is a very high yield for the country in the vicinity of the capital, which is not situated in the best of the cotton country, and the result was very satisfactory.

The second plot was sown very late to demonstrate the advantages of early seeding.

FOODCROPS

40. A small amount of food is grown on the plantation and is used principally for feeding the labourers.

The plantains employed as shade for cacao naturally produce a quantity of food, and during the year 3,530 bunches were gathered.

Fourteen tons of sweet potatoes were harvested. The remainder of the food crops grown consists of Rose Coccus Beans, Soy Beans, Maize, Ground-nuts, Dhal and Buckwheat. Small plots of each of these were sown and altogether produced a little over a ton of foodstuffs.

SOIL PRESERVATION AND GREEN MANURE CROPS

41. A variety of crops was employed to prevent excessive wash. A large portion of the plantation is on a very steep slope and the loss of soil during a heavy fall of rain is very great, unless the use of cover crops is resorted to.

The principal plants used for this purpose were *Mucuna gigantea*, *Crotalaria striata*, *Tephrosia purpurea*; the various edible beans were also employed to some extent for this purpose.

OTHER PLOTS

42. A small plot of exotic fruit trees was established. Among the fruits growing on this plot are the Jack Fruit, Rose Apple, Grape Fruit, Mulberry, Tree-Tomato, Giant Paw-paw and two varieties of Bananas.

A few acres of Castor-oil were grown. The seed finds no market locally and the plant is grown by the natives only for the poles. The plots were chiefly interesting as a study of the varieties of the plant ; no less, than ten distinct varieties were observed.

A small plot of Co-ca was put in.

The Areca-nut palm and ginger are among other plants that have been growing on the plantation for some time, neither of these plants seem to make any appreciable progress.

NURSERIES

43. The nurseries were considerably extended and in addition to the usual plantation crops, a large number of trees and shrubs are being raised ; some of these are newly imported exotic plants.

Considerable numbers of ornamental plants and shrubs are propagated in the nursery and are always available for planting gardens.

GENERAL

44. The plantation was under the management of Mr. J. D. Snowden, Assistant District Agricultural Officer, for the greater part of the year under review. Mr. Snowden proceeded on leave towards the end of the year, since when I have been in charge.

TYRRELL BRUCE,

District Agricultural Officer.

Report on the Government Plantation, Kakumiro, Mubendi.

45. The plantation is situated 19 miles north from Mubendi, and is connected to that station by a newly completed road which is passable for light carts during the greater part of the year.

Until 1907, Kakumiro was the Administrative centre for the district, but was evacuated in favour of Mubendi during that year.

From 1907 until May 1912, no European was in residence and the plantation was managed by a native headman, consequently, during the intervening years, no detailed figures were kept of the yields obtained.

In May, the Department of Agriculture assumed control and a District Agricultural Officer was in residence for the remainder of the year.

The altitude of the plantation is approximately 4,500 feet.

RAINFALL

46. No complete returns are available, but the following figures show the rainfall for the six months ended March 1913 :—

Month	Inches
October	3.01
November	6.06
December	1.10
January	1.17
February	2.85
March	3.91

The total area under cultivation on March 31st was 30 acres, divided up as follows :—

Crops	Acres
Coffee	14.39
Para	4.44
Funtumia	.12
Ceara	1.75
New Clearing	9.30

Now being planted
with coffee.

COFFEE—Arabica.

47. As will be seen by the above figures there are 14.39 acres under coffee, the oldest having been planted in 1904 and the youngest in 1912 ; a further area is being planted this year (1913.).

Full particulars as to yield, etc., will be found in Table showing particulars of Coffee Yield, Season 1912-1913, embodied in this report, and, when reading these figures, the fact must be taken into consideration that for the four years 1908-1911 there was no proper supervision on the plantation, consequently there was a certain amount of neglect and many of the trees died out.

Notwithstanding this fact, the yield has been very satisfactory, and the figures will, no doubt, be of interest to planters.

Picking commenced 5½ months after the trees flowered.

At the end of March, the plantation was carefully examined for leaf disease, and fortunately no sign of it could be found.

**TABLE SHOWING PARTICULARS OF COFFEE YIELD
SEASON 1912-1913**

Year planted	Area	Total trees	Average number of trees per acre	Distance apart	Yield 1st picking lbs.	Yield 2nd picking lbs.	Total yield lbs.	Average yield per acre lbs.	Average yield per tree lbs.
1904	5.23	2,750	525	ft. 8 x ft. 8	5,104	402	5,506	1,052	2
1906	2.11	1,220	578	8 x 8	2,002	318	2,320	1,099	1.89
1907	1.90	926	487	8 x 8	1,098	348	1,446	761	1.56
1910	1.95	1,332	683	8 x 8	578	348	926	474	.69

PARA RUBBER

48. The Para rubber has shown a very poor growth during the year, chiefly owing to the fact that "Lumbugu" grass has obtained a firm hold.

No tapping results are available as the District Agricultural Officer was continually on tour and it was not found possible to train a native to keep continuous tapping figures satisfactorily.

CEARA RUBBER

49. A small block of this variety was planted up in July and in March; the trees showed a vigorous growth.

A severe wind-storm early in the year (1913) rooted up several trees.

50. PARTICULARS OF GROWTH AT 6 YEARS OF PARA AND FUNTUMIA RUBBERS

Planted 20 feet by 20 feet

Particulars of measurements	Para	Funtumia
Average girth	12.12 inches	13.71 inches
" height	18.15 feet	16.14 feet
Maximum girth	18.50 inches	19 inches
Minimum "	6 "	8 "
Maximum height	25 feet	20 feet
Minimum "	11 "	12 "

COTTON

51. A plot of cotton, one acre in extent, was sown with "Allen's" in June 1912.

The seed was sown at a distance of 4 feet by 2 feet and the plants were singled in August.

Picking commenced in February and finished at the end of March.

The total yield of seed cotton was 539 lbs.

FOOD CROPS

52. A small plot of hill rice, half an acre in extent, was sown in September and proved a failure. The seed was obtained from a native chief in the Buyaga district and was probably very old.

Other food crops planted were Maize, Beans, Sim-sim, Ground-nuts, and Sweet Potatoes, and the resultant crops were sold to the labourers on this plantation for food.

EXPENDITURE

53. On referring to the Accounts it will be seen that there has been a clear profit of over £100 on the year's work.

The amount expended on labour included the cutting of a new road 350 yards long, the thatching of servants' quarters, and the building of three new outhouses.

Also a good sum has been expended from time to time repairing the thatch of the bungalow.

TOURING AND NATIVE INSTRUCTORS

54. Nine months of the year were taken up touring in the various districts, which included Toro, Buyaga, Bugangadzi, Bwekula, Singo, Busuju, Butambala, Mawokota, and Gomba.

In Toro, the wheat industry has been very steady. No increase in area was recorded as it was found that the one small flour mill in the district was not capable of dealing with the crop.

It was decided in September by the Church Missionary Society, Fort Portal, to purchase a small power mill, and it is hoped that this year will see an increased acreage.

The Mubendi District has shown great improvement all round, in most parts the cotton crop has been a success, and the good prices realized have encouraged the natives to take a real interest in the cultivation of cotton.

The area under coffee has been greatly increased during the last twelve months and practically every chief has a small plot; another three years will see a big output from native plantations. Many of the larger chiefs have plantations five years old which are giving a good return.

Kakumiro has proved an excellent centre to work from, porters are readily available, and it is possible to proceed to any part of the district at the shortest notice.

The fact of there being an Agricultural Officer in residence at Kakumiro is fully appreciated by the chiefs and the bakopi who come in large numbers for information and advice.

Eleven of the native instructors reported regularly at Kakumiro every month; they have done very good work, and with their aid it has been possible to keep in the closest touch with agricultural matters, even in the most remote parts of the district.

55. EXPENDITURE AND REVENUE 1912-1913

Expenditure	Rs	Cts	Revenue	Rs	Cts
Labour for month of April	72	72	Sale of 10,208 lbs coffee		
„ „ „ May	116	40	@ £43 per ton ...	2,928	75
„ „ „ June	112	98	Sale of 481 lbs cotton		
„ „ „ July	107	16	@ Rs. 8/50 per 100 lbs	40	88
„ „ „ August	123	36	Sale of 58 lbs cotton		
„ „ „ September	92	04	@ Rs. 6/50 per 100 lbs	3	77
„ „ „ October	228	92	Sale of various food		
„ „ „ November	106	20	crops	11	25
„ „ „ December	116	76			
„ „ „ January	88	68			
„ „ „ February	129	96			
„ „ „ March	135	72			
Balance	1,553	75			
Rs. 2,984 65			Rs. 2,984 65		

Total Revenue for the Rs. Cts.
year..... 2,984 .. 65

„ Expenditure for
the year ... 1,430 .. 90

Credit Balance Rs. 1,553 .. 75

A. R. MORGAN,

District Agricultural Officer.

Report on the Government Plantation, Kadunguru, Bugondo.

WEATHER

56. The following shews the rainfall at Kadunguru month by month from 18th April, 1912, the date on which records began to be kept, to 31st March, 1913.

Month	Number of days on which rain fell	Amount of rain in inches.
April (from 18th)	6	3.75
May	14	7.12
June	11	4.55
July	11	4.00
August	11	7.85
September	11	3.26
October	10	3.17
November	9	3.31
December	2	0.58
January	Nil	Nil
February	7	3.95
March	9	4.17
From 18th April to 31st March 99		45.71

COTTON SEED SELECTION AND PROPAGATION

57. This work began with my arrival in the country 18 months ago. It would be as well to give a short resumé of the work from the beginning up to the date of this report.

In the season 1911-12 the American Upland longstaple varieties—Allen and Sunflower—were grown in restricted areas in Bukedi; the seed for these areas having been propagated from small quantities procured in America and East Africa in 1910.

No selection work had been done and it was found on examination in the field that the staple showed much irregularity in length. The Sunflower from British East Africa was the worst in this respect, and while a few staples of $1\frac{1}{2}$ inches were found, there were some as low as $\frac{1}{2}$ inch, and the average would not be more than $1\frac{1}{8}$ inches.

The other Sunflower variety and the Allen were more regular and were found to average 1-3/16 inches.

The need for improvement in the quality of the staple by selection and propagation from the individual plant was apparent, and this work was started at Kadunguru, eight miles from Bugondo Port, and 50 acres of land were cleared for carrying on the work, besides the necessary buildings being erected.

A sufficient quantity of seed to sow 40 acres on the plantation was obtained from a local chief. This cotton was carefully examined and 'rogued out', all the plants with staples of less than 1-3/16 inches being rejected and pulled out.

An area of 32 acres actually sown with the above seed yielded about 14,000 lbs. of seed cotton, or 440 lbs. per acre.

A careful examination of the above cotton disclosed a satisfactory improvement in the length and quality of the staple. The lint retained its silkiness and strength, and the average length was increased from 1-3/16 to 1-5/16 inches. Staples of less than 1 inch were rarely found, which is remarkable in view of the fact that large numbers of very short staples were found in the previous crop. The percentage of lint to seed was found to be 30.5%.

Next season's crop of above seed will be grown in a restricted area near Kadunguru Plantation.

Individual plant selections were made from plants of native grown B.E.A. Sunflower.

These were judged according to a scale of points with regard to the lint only.

The following characters were considered :—

Length of staple,—	Marks	Total
Less than $1\frac{1}{4}$ inches	0	
Between $1\frac{1}{4}$ and $1\frac{1}{2}$ „	20	
$1\frac{1}{2}$ inches and above	40	40
Percentage of Lint—		
Less than 27%	0	
Between 27% & 30%	10	
Above 30%	20	20
Regularity—		
Poor regularity	0	
Medium „	10	
Good „	20	20
Strength—		
Poor strength	0	
Medium „	10	
Strong	20	20
		100

Habit, productivity, etc., of the plant were not taken into consideration because the selection work did not begin until late in the season, and most of the plants had already been picked of their first bolls.

In all, 85 plants were selected as being suitable for propagation. The seed from each plant was sown separately in plots which were separated from each other by rows of Maize.

When the first bolls were open an examination of the lint was made to determine the quality of the transmitting power of the parent plant. In a few cases this was found to be unsatisfactory, but in the majority of the lots the results were good and several of the best were selected for propagation.

In all, 21 plots were selected, having a maximum length of staple of $1\frac{1}{2}$ to $1\frac{3}{8}$ inches. These plots were carefully examined and rogued out; the work having been done three times to ensure that none of the plants were missed. The seed cotton from these plants was ginned by the Bukedi Cotton Co., and the percentage of lint to seed was found to be 31%. This seed will sow 40 acres in the plantation next season.

The whole of the cotton crop on the plantation suffered severely from the rain and hail storms during the month of August. There was also a considerable amount of disease on the plants including Aphis Blight, Scale Bug, and Boll Worm.

On this account, and because no plants of outstanding merit could be found, no individual selections were made among the plantation crops.

My attention was directed to some plots of native grown Allen cotton near to Kadunguru, which showed remarkable characteristics in regard to productivity, earliness, and freedom from disease.

Seventy individual plants were selected from these plots. These plots were marked and numbered and, during growth, notes were made as to immunity or otherwise to fungoid diseases, and insect pests, and also as to the habit, etc., of the plant. The cotton from each plant was bagged separately, and the lint carefully examined in the house in order to ascertain the characters which go to make up the best quality lint. These were judged according to a scale of points based on that in use in Barbados, but modified to suit the special conditions existing here.

The following is the SCORE FOR COTTON SEED SELECTION IN BUKEDI.

PLANT.			
		Marks.	Total.
Habit.	Erect <i>v.</i> recumbent	- 2	—
	Compact <i>v.</i> Straggling	- 2	—
	Early <i>v.</i> Late Maturity	- 1	5
Resistance of Pests.	Insects	- 10	—
	Fungoid diseases	- 5	15
Productivity.	Under 40 bolls	- 0	—
	Between 40 & 60	- 5	—
	Over 60 bolls	- 10	10
LINT.			
Length of Staple.	1-5/16 to 1-9/16 inches		
	5 points for each 1/16	- —	20
Distribution of Lint on seed.	Very uniform	- 5	—
	Uniform	- 3	—
	Fairly uniform	- 1	5
Regularity of length.	Very regular	- 10	—
	Regular	- 5	—
	Fairly regular	- 3	10
Strength.	Very strong	- 20	—
	Strong	- 10	—
	Fairly strong	- 5	20
Proportion of Lint to seed.	25% to 35%		
	1 point for each %	- —	10
Silkiness.	Very silky	- 5	—
	Silky	- 3	—
	Fairly silky	- 1	5
			100

A report of the examination of some of these selections is appended.

It was difficult to find plants with a staple over 1½ inches in length. Many of the selections showed great regularity of staple, while the strength and proportion of lint to seed were generally very good. The seed from these selections will be sown in the experimental plots on the station next season.

A comparison between the Allen and Sunflower cottons discloses several points in favour of the former. The plants of the Allen variety are more compact with a strong central stalk and they seem to withstand the storms better than the Sunflower, whose straggling branches often get beaten to the ground. Again, in the case of the Allen, the cotton comes more readily from the boll and the picking is easier ; this is an important point where large areas are to be picked.

TOBACCO

58. Experiments were carried out with three varieties of pipe tobacco, namely, White Stem Orinoco, Conqueror, and North Carolina bright yellow. All of these did well in the field but on account of the rain and hailstorms the crops did not come to maturity until five months after sowing.

Facilities for drying and curing the leaf were not good. A small resthouse was the only drying house available, and this was difficult to ventilate, in consequence of which much of the leaf dried too quickly with a green colour.

Fermentation of the leaf was attempted but without much success. It seems likely that the particular enzymes which cause the desired changes in the leaf for the production of a good smoking tobacco are absent and, if it were possible to introduce those in the form of pure cultures—as is done in dairying,—I do not doubt that a good pipe tobacco would be produced.

It was found that early sowings did best, *i.e.*, sowing the nursery in April and May and planting out in May and June.

COFFEE.

59. A small nursery was put down in May. A thin plant was obtained and the plants were weak and without vigour. In November 500 plants were planted out and about 400 of these have survived the dry season.

RICE.

60. Seed of a dry land variety was used and was sown on the black land at the edge of a swamp. Transplanting was done and the crop came to maturity in 4 months. A yield of about 20 bushels per acre was obtained.

INDIAN GRAM.

61. This crop was successful. The best sowing season was found to be immediately after the heavy rains in May.

BUCK WHEAT.

62. This crop was very successful. Buck Wheat should form a useful adjunct to the food crops of the natives. It is easy to grow, will do well in the poorest soils and requires a very short period between sowing and reaping—about two months.

The above three crops are suitable for native cultivation and should be encouraged.

PLOUGHING INSTRUCTION.

63. A Ploughing School has been held throughout the year on the plantation, and during the year under review good progress was made with the work of teaching the natives the use of the plough.

R. G. HARPER,

District Agricultural Officer.

Report by The Chief Veterinary Officer.

64. I returned from leave on December 14th 1912, having been absent from the commencement of the year.

Mr. Broome was transferred to British East Africa and left the Protectorate on September the 24th.

Stock Inspector Strauss was appointed on May 21st.

Stock Inspector Grierson was appointed on September 28th and resigned his appointment on March 28th.

CATTLE DISEASES

65. EAST COAST FEVER. The Veterinary Staff being mainly engaged throughout the year on the suppression of Rinderpest in the Eastern Province, but little progress was made on the mapping out of areas in which East Coast Fever is endemic in this Protectorate. The following information was, however, obtained from the movement of cattle in the Eastern Province.

Some thirty oxen, which were selected from various parts of the Teso and Lango districts, were immunised against Rinderpest and passed down to Kampala where East Coast Fever is highly endemic; none of these cattle have as yet contracted the disease although they have been exposed to infection for more than four months; the conclusion that this disease is endemic in the Lango and in the greater part of the Teso district is therefore confirmed.

During the year, about 658 head of Government cattle were sent from Karamoja to the Mbale district.

Of the first two mobs sent down, numbering 405, all died except 45 head; but no definite information was obtained as to the cause of this mortality.

A third mob numbering 253 head was sent down in October and of these 75% had died by the end of March, the majority of the deaths being due to East Coast Fever as proved by the presence of "*Kochs granules*" or "blue bodies" in the smears submitted for examination. It may therefore be taken as proved that East Coast Fever is not endemic in those parts of Karamoja from which these mobs were drafted.

It is open to question whether East Coast Fever will ever assume an endemic form amongst the Karamojan herds. In former years, cows, heifers and calves from districts where the disease is highly endemic were traded with the Karamojans in exchange for sheep.

Infected cattle were no doubt introduced time after time. It is probable, however, that the nomadic habits of the natives have tended to prevent the disease obtaining any permanent hold in the country.

EASTERN PROVINCE

66. RINDERPEST. *Busoga District.* An outbreak of Rinderpest occurred at Naibiri in the neighbourhood of Iganga during April, the cattle in the infected areas were immunised by the "mixed method." The resulting mortality was low, and the outbreak was stamped out towards the end of May.

Wild pigs were reported by the natives to have died from Rinderpest during April in Eastern Busoga.

No fresh outbreaks were reported in this district until November when Rinderpest again appeared near Iganga, but this very localised outbreak died out without having caused much loss.

In February a small outbreak was reported from Samia in Busoga, Kavirondo. The source of infection in each case is believed to have been Kavirondo.

The Mbale district remained free from Rinderpest until October when the disease appeared in Budama on the East African boundary ; owing to the difficulties in maintaining an effective quarantine in Budama, where cattle are very numerous, the disease made considerable headway.

Heavy losses were, however, prevented by the inoculations which were carried out during the ensuing months. In February, there was a further spread of the infection, but, owing to the better observance of quarantine, the disease did not make any further spread during March.

In the Teso district, there were a number of centres of infection at the commencement of the year. Inoculations on a large scale were carried on North of Lake Salisbury and subsequently at Serere, Soroti and Lalli. No new outbreaks have been reported from these parts of the district which, except for a small outbreak near Kumi, now appears to be free from the disease.

In the Lango district some small outbreaks were reported in the Kuman country in which, however, the majority of the cattle are now immune.

The following summary shows the numbers of cattle which were inoculated against Rinderpest in the several districts of the Eastern Province during the year :—

District	No.
Busoga	4,219
Bukedi	6,473
Teso	22,599
Lango	4,920
Total	38,211

Of these, 1,559 were trade cattle immunised in the Bukedi districts for transport work in the Eastern Province ; 2,026 were trade cattle which received a protective dose of serum before being exported to British East Africa. Of the remainder, approximately 30,000 were immunised by the "mixed method" of injecting a dose of virulent blood at the same time as the dose of Anti-Rinderpest serum.

This method gave very satisfactory results in the field, and although it was not possible to check the re-actions in every locality in which these inoculations were carried out, the mortality seldom exceeded 5% in any instance.

It is not anticipated that there will now be any outbreaks in Eastern Province which will involve heavy losses, unless Rinderpest should spread into parts of the Province which have remained free from infection for the past three years and in which there are a number of susceptible cattle, but, while centres of infection remain particularly in unadministered areas, there is always the possibility of this taking place.

In the Northern Province, outbreaks of Rinderpest were reported during the year from the district of Nimule, Chua and Gulu. 75% of the cattle which contracted the disease are reported to have succumbed, but no data exists on which to base an estimate of the total number which have died.

WESTERN PROVINCE

67. In February it was reported that Rinderpest was spreading southwards in German East Africa, but no information as to the actual distribution of the disease in that Protectorate has as yet been received. Recommendations were submitted for the appointment of a Veterinary Officer and a Stock Inspector for work in the Western Province and for the provision of a sufficient supply of Anti-Rinderpest serum to deal with primary outbreaks on the German border. When Rinderpest appears in Ruanda and Karagwe which lie south of the Western Province, all the local conditions will favour its introduction and rapid dissemination into and over all the uninfected districts to the West of the Nile. Should this happen in the next few months, there is now neither staff nor serum to cope with such a situation.

TRYPANOSOMIASES

68. Diseases due to Trypanosomes, of which *T. Pecorum* is by far the most common, continue to cause heavy and serious losses in Bunyoro and in many parts of the Buganda Province.

Outbreaks, which in some cases carried off half the affected herds, occurred during the year in the counties of Bugerere, Buruli, Bulemezi and Bwekula.

Bugerere and Buruli were until recent years noted as particularly healthy districts for cattle, and there appears to be good reason to believe that the disease is of fairly recent introduction into the north-eastern parts of the Province.

It is somewhat peculiar that in the Eastern Province no losses amongst the native herds from *T. Pecorum* have as yet come under notice, although cattle from that Province are just as susceptible to this Trypanosome as those of Buganda when introduced there.

The freedom of the Eastern Province districts from Trypanosome diseases is particularly noticeable in the Teso district which contains as many cattle as the whole of the Buganda Province.

So far as I am aware there is nothing in the distribution of the various species of biting flies in either Province which would in any way account for the absence of this infection of the Eastern Province herds.

One possible explanation is that in the Teso district there is no big game, which is only to be found in a few limited areas of the Eastern Province, whereas on the other hand, big game, and particularly buffalo, are very numerous and are very widely distributed in Buganda.

Until the agent which transmits this Trypanosome is definitely known, and its natural reservoirs have been ascertained, there is but little prospect of making any real headway in preventing the further spread of what is by far the most deadly and uncontrollable of any of the diseases of cattle in this Protectorate.

DISEASES OF SHEEP AND GOATS.

69. A number of deaths occurred amongst a flock of Karamojan sheep and goats which had been brought down to Mbale; the deaths appear to have been due to parasitic gastritis.

Mange in goats is responsible for a number of deaths in many parts of the Protectorate.

DISEASES OF HORSES AND MULES.

70. Lymphangitis is widely prevalent in the Protectorate, and is very common amongst mules.

The progress of the disease can often be arrested if cases are treated in the earliest stage, but it is doubtful if a permanent cure can be effected once the disease spreads beyond the point of infection.

Two cases of horse sickness were seen during the year. Both proved fatal.

DISEASES OF DOGS.

71. Rabies has been reported in jackals in British East Africa, but no cases have as yet been heard of in this Protectorate. Restrictions on the importation of dogs have been imposed.

Many cases of Piroplasmosis have been sent for treatment, the great majority of which have recovered after an injection of Trypanblue.

EXPORTATION OF CATTLE.

72. The export of cattle to British East Africa which was commenced towards the end of 1911, continued during the year. 2,030 head, of which the great majority were cows and heifers, were exported.

The numbers exported would have been considerably greater were it not for the prevalence of Rinderpest both in the Eastern Province and the neighbouring districts in British East Africa.

During the year, 178 bulls and bullocks were purchased for the production of Anti-Rinderpest serum in the Buganda Province on behalf of the Veterinary Department of British East Africa and shipped to Nairobi.

73. ENTEBBE SLAUGHTER HOUSE RETURNS.

From 1st April to 25th August, 1912.

Months	Goats	Sheep	Cattle	Seizures
April	178	94	49	35
May	166	91	47	32
June	238	93	41	31
July	203	134	41	28
August	116	89	17	27
Totals	901	501	195	153

74. KAMPALA SLAUGHTER HOUSE RETURNS.**From 1st June 1912, to March, 1913.**

Months	Goats	Sheep	Cattle	Seizures
June			19	5
July		20	30	3
August			42	35
September	259	90	4	42
October	229	106	51	47
November	164	75	44	42
December	220	112	61	55
January	321	113	64	70
February	256	116	64	70
March	305	138	72	67
Totals	1,754	770	451	436

75. JINJA SLAUGHTER HOUSE RETURNS.**From 1st April 1912, to 31st March 1913.**

Months	Goats	Sheep	Cattle	Seizures
April	22	47	8	9
May	30	22	14	7
June	86	101	12	19
July	87	102	16	25
August	120	29	18	27
September	51	23	24	37
October	98	56	10	41
November	59	35	12	18
December	52	31	26	24
January	57	7	19	17
February	18	17	21	18
March	18	10	23	22
Totals	698	480	203	264

76. NUMBER OF ANIMALS TREATED AT KAMPALA, ENTEBBE & JINJA.

From 1st April 1912, to 31st March 1913.

Cattle 408. Mules 76. Donkeys 15. Ponies 2. Horses 3. Dogs 140. Sheep 3. Cat 1. Goat 1. Parrots 2. Bird 1. Fowls 30.

77. SUMMARY OF MICROSCOPIC EXAMINATION MADE.

No of slides examined 447.

Cattle 388.

East Coast Fever	...	9	Piroplasma	...	...	5
Trypanosomes	...	30	Anaplasma Marginale	...	...	1
Bacteria	...	2	Microfilaria	...	...	2
Negative	...	339				

Dogs, 37.

Trypanosomes	...	2	Helminths	...	...	2
Piroplasma	...	10	Negative	...	...	23

Sheep 6.

Rod shaped Bacillus 6

Goats 5.

Mange	...	...	1	Negative	...	...	4
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Mules 3.

Negative ... 3

Pony 1.

Negative ... 1

Game 7.

Buffalo, Negative	2	Water Buck, Negative	...	3
Topi-Koch's granules (?)	2			

SAFARI WORK.

78. During the year, all the districts of the Eastern Province were thoroughly toured by Veterinary Officers and Stock Inspectors. Tours were also made in the districts of Gulu, Masindi and in a few of the counties of the Kampala district.

In March, I visited Nairobi to confer with the Chief Veterinary Officer of Nairobi, East Africa, as to the present distribution of Rinderpest in Uganda prior to his leaving to attend the recent International Veterinary Conference at Bulawayo, and on the questions which were to be discussed at the Conference, so far as they related to this Protectorate.

I was unable to carry out any tours in January or February as the arrangements for the purchase and shipping of the weekly consignments of cattle required for the production of serum in East Africa necessitated my remaining at headquarters.

GENERAL REMARKS.

79. In the districts which have already been visited by Rinderpest, further heavy losses are not likely to occur, but the danger of its being introduced across the Nile is constant so long as centres of infection remain in the Eastern and Northern Provinces, in which the disease appears to be tending to become endemic, more particularly in the unadministered parts of the Protectorate.

During the past year, the available Veterinary Staff was employed almost entirely in the Eastern Province on the inoculation of cattle for the suppression of Rinderpest and little else could be attempted elsewhere.

In an unfenced open country such as this, where cattle owned by raw natives have to be handled, the results obtained speak well for the way in which the Veterinary Officers and Stock Inspectors concerned worked during the year.

E. HUTCHINS,

Chief Veterinary Officer.

Report by The Entomologist.

80. INSECTS ATTACKING COFFEE

SCALE INSECTS (*Coccidae*)

As in the preceding year, Scale Insects are the worst pests on coffee. The remedy for these insects is to spray with a contact poison, that is, a spray which kills by coming into contact with the insect and sealing up its pores or corroding its body wall: but the difficulty locally in working with such sprays is to get the spraying done so thoroughly that few insects escape the spray and, as these insects reproduce rapidly, when a very few are left untouched a recrudescence frequently results.

Several more species were reported as pests on coffee, but up to the present those that have been identified are:—

- Lecanium africanum*, Newst.
- Lecanium viride*, Green.
- Stictococcus gowdeyi*, Newst, (sp. nov.)
- Pulvinaria psidii*, Mask.
- Ceroplastes ceriferus*, And.
- Ceroplastes galeatus*, Newst.
- Ceroplastes virisonoides*, Newst.

Lecanium africanum, Newst.—This species was easily the most prevalent during the year. It attacks both vigorous and weakly trees, the latter usually fatally, as they are defoliated, the young leaves becoming infected as soon as they open. Happily, this pest has been treated with great success with a solution of whale-oil soap at a strength of 1 lb of the soap to five gallons of water.

Lecanium viride, Green.—Both this species and the above mentioned *Lecanium* are associated with an unsightly black fungus, which lives on the 'honey-dew' excreted by them. Like the above species, *L. viride* has become very prevalent during the year and like that species, also, it has proved susceptible to treatment with whale-oil soap. It restricts its attacks to the under surface of the leaves and to young shoots.

It is preyed on by the Coccinellid beetles, *Chilocorus discoideus*, Crotch, and *C. punctata*, and parasitised by a chalcid not yet identified.

Stictococcus gowdeyi, Newst.—This new species of Coccid restricts its attacks to the young shoots. Like the species *St. dimorphus*, Newst., which attacks cacao, it is rather difficult to kill without using insecticides at such strengths as to affect the foliage, and in this country, probably due to the altitude, oils even when used at the usual strengths are apt to 'burn' the foliage.

Pulvinaria psidii, Mask.—This year a large percentage of this species was parasitised.

Ceroplastes ceriferus, And.—The other food plants of this insect are tea, *Anona muricata*, *Citrus* spp., *Ficus* sp. and *Antigonon*.

Of the unidentified species, there is one which attacks the stems of the berries with the result that the berries blacken and eventually drop off. Spraying with whale-oil soap has been resorted to with success.

2. MEDITERRANEAN FRUIT-FLY

(*Ceratitis capitata*, Wied.)

This pest breeds throughout the year in this country provided that there is suitable food available, and there seems to be no lack of food of some kind, cultivated or wild, always available.

The life-history of the March brood of this insect has been worked out. It is hoped later to have the opportunity of working out the life-histories of the broods throughout the year. In all probability the length of the several stages of the other broods will prove to be somewhat longer, as at the time of the March brood, food, at any rate cultivated food, is more plentiful.

The female uses her extensile ovipositor to pierce the berry and to lay the eggs under the skins. The eggs are usually laid in varying numbers, sometimes singly. The eggs apparently will not hatch when deposited in green berries: at any rate a great many perish that are laid in green berries. The maggots on hatching immediately begin to feed, and in the case of coffee berries, make for the pulp between the beans in most cases. Here the maggots feed for from fourteen to twenty days. At the end of this period, the maggots leave the berries and bury themselves in the soil to a depth of about two inches. The insect remains in the puparial stage from twelve to twenty days. When the flies emerge from the puparia, they work their way through the soil and as soon as their wings have dried, fly in search of food and mates.

The ripeness of the berries appears to be a big determining factor in the rapidity of the development of the insect. The development is also influenced by heat as evidenced by keeping a case in a room the temperature of which was about 5°F. higher than that in which the other cages were kept. This cage was consistently twenty-four hours ahead of any of the others.

TABLE I.—LENGTH OF STAGES OF MARCH BROOD

Number of observa- tion	Days of				Days for			
	Egg deposition	Incubation period of egg	Maggots leaving fruit	Emergence of adults	Egg hatching period	Larval period	Pupal period	Cycle of brood
1	March 4	March 8	March 28	April 17	4	20	20	44
2	" 6	" 10	" 30	" 19	4	20	20	44
3	" 7	" 10	" 30	" 17	3	20	18	41
4	" 9	" 13	April 2	" 22	4	20	20	44
5	" 10	" 13	" 1	" 19	3	19	18	40
6	" 12	" 15	" 2	" 10	3	18	16	37
7	" 13	" 15	" 2	" 20	2	18	18	38
8	" 14	" 16	" 1	" 19	2	16	18	36
9	" 15	" 18	" 4	" 20	3	17	16	36
10	" 16	" 18	" 1	" 13	2	14	12	28
11	" 18	" 20	" 5	" 21	2	16	16	34
12	" 19	" 21	" 4	" 16	2	14	12	28
Maximum					4	20	20	44
Minimum					2	14	12	28
Average					2.83	17.66	17.0	37.5

FOOD PLANTS. The maggots of this insect have been bred on *Anona muricata*, banana, coffee berries, guava, lemon, orange, pine-apple, papaya

PARASITES. Although several parasites have been reared from this fly in different parts of the world, none seems to be capable of holding it in subjection. Experiments to find any parasites locally have failed, except in a single instance: but, as this parasite is evidently very scarce, it is of negligible value in keeping the pest under control.

3. CRICKETS.

{ *Gryllus bimaculatus*, de G. }
 { *Gryllotalpa africana*, P. de G. }

The latter species appears to be as prevalent as in the previous year: but *G. bimaculatus*, of which complaints of its ravages have only been reported this year, is the more destructive. This is particularly so in nurseries in which heavy shading is practised.

4. BORING BEETLE.

(*Dirphya (Nitocris) princeps*, Jord.)

No report of damage done by this insect has been received during the year. The precautions adopted to prevent the spread of the outbreak reported in my Annual Report for 1911-12 seem to have been successful. A closely related species *N. usambica*,* Kolbe is very destructive to coffee in German East Africa.

5. "WHITE ANTS."

(*Termes bellicosus*, Linn.)

There is a sense of false security amongst planters whose plants have not yet been attacked by these insects, and even amongst those whose plants are attacked: the latter's usual reply to warnings against taking no steps to control these pests is:—White ants only eat the bark. Some of them are awakening to the emptiness of this consolation.

When land is cleared in Uganda the trees are felled and either burnt or allowed to remain where felled unburnt. The burning may be done thoroughly, but hardly ever. The partly burned and wholly unburnt trees remaining in the fields constitute a food supply for years. It would be surprising if an insect of such voracious habits as our Termites did not attack living coffee plants, planted amidst such perfect conditions for multiplication. The object of the planter, of course, is to bring his plants to the bearing stage as quickly and as cheaply as possible, regardless of the consequences which follow such shortsightedness.

Those who from experience are beginning to realize the importance of the question, regard the expense of undertaking to reduce this pest in their plantations as prohibitive. Such an argument is hardly sound. Steps should be taken to remove the cause by the removal of the nests and felled trees, and cleaner cultivation generally.

6. COFFEE BEETLE.

(*Stephanoderes Coffeae*, Haged)

This insect continues to attack coffee berries throughout the country: yet I consider that it is causing less loss to coffee growers at present than at any time since its discovery as a coffee pest in 1908.

* Morstatt, "Die Schädlinge und Krankheiten des Kaffeebaumes in Ostafrika," page 45.

81. INSECTS ATTACKING CACAO.

1. SCALE INSECTS.

(*Stictococcus dimorphus*, Newst.)

This scale insect was parasitised this year to a greater extent by the Noctuid moth *Eublemma costimacula*, Saalm. Experiments to ascertain this point were carried on this year and the preceding year for the same length of period during the same month, and it was found that the percentage of parasites bred this year from the same number of scale insects was 16 per cent higher than the preceding year.

Experiments were made to find a spray which would be more effective against this pest than whale-oil soap, which I have always recommended to be used. The results are tabulated below :—

TABLE II. SHOWING EFFECT OF CERTAIN INSECTICIDES ON
ST. DIMORPHUS.

Box Number	Treatment	Date of Spraying	First Examination March 9.			Second Examination March 16.		
			Number of scales examined	Number of dead scales	Percentage of dead scales	Number of scales examined	Number of dead scales	Percentage of dead scales
1	Whale-oil soap	Mar. 4	200	85	42.5	50	11	22.0
2	" "	" "	200	145	72.5	50	18	36.0
3	Kerosene emulsion	" "	200	69	34.5	50	9	18.0
4	Borax	" "	200	152	76.0	50	24	48.0
5	Resin soda	" "	200	30	15.0	50	8	16.0

Box No. 1 was treated with whale-oil soap in the proportion of 1 lb. of the soap to 7 gallons of water, and the formula of the spray of Box No. 2 was 1 lb. soap to 4 gallons of water. Box No. 3 was treated with kerosene emulsion made in accordance with the formula :—

Water 1 gallon.
Kerosene 2 gallons.
Soap, hard ½ lb.

Box No. 4 was treated with a 20 per cent solution of Borax.

The Resin soda wash with which Box No. 5 was treated is :—

Resin 5 lbs.
Caustic soda 1½ lbs.
Fish oil ¾ "
Water 25 gallons.

The Borax spray proved the most effective, but it injured the pods.

2. PLANT LICE.

(*Aphis* sp. (?))

Plant lice have only been observed to attack cacao from about one to two-and-a-half years old grown under heavy shade of bananas. They attack the undersides of the young terminal leaves and, if no steps are taken to control these insects, the leaves curl, and form a cabbage-like mass. They are always associated with an ant, to which the planter often attributes the injury of the plants.

This *Aphis* is preyed on by the *Mantids*, *Spodromantis lineola*, Burm and *Pseudocreobotra wahlbergi*, Staal.

3. CRICKETS.

{ *Gryllotalpa africana*, P. de B. }
{ *Gryllus bimaculatus*, de G. }

As these insects are eaten by the natives, hand collecting has proved successful : the diminution of the insects being quickly apparent. The operation can be carried out most satisfactorily by placing hiding places in the nurseries, such as grass or pieces of banana leaves, under which the crickets will hide during the day and can then be easily collected.

4. CACAO FRUIT FLY.

(*Ceratitis punctata*, Wied)

The habits of this fruit fly are similar to those of the Mediterranean fruit fly on coffee. The life-history has been worked out in detail and a similar table to Table I, is appended for comparison.

TABLE III—SHOWING LENGTH OF STAGES OF NOVEMBER BROOD.

Number of observation	Days of				Days for			
	Egg deposition	Incubation period of egg	Maggots leaving fruit	Emergence of adults	Egg hatching period	Larval period	Pupal period	Cycle of brood
1	Oct. 29	Nov. 11	Jan. 4	Jan. 21	13	54	17	84
2	" 30	" 13	" 7	" 27	14	55	20	89
3	" 31	" 14	" 1	" 18	14	48	18	80
4	Nov. 2	" 14	" 4	" 22	12	51	19	82
5	" 3	" 16	" 8	" 26	13	53	18	84
6	" 5	" 17	" 4	" 21	13	48	17	78
7	" 6	" 18	" 6	" 25	12	49	19	80
8	" 7	" 21	" 14	Feb. 2	14	54	19	87
9	" 8	" 18	" 9	Jan. 27	10	52	18	80
10	" 10	" 21	" 9	" 25	11	49	16	76
11	" 11	" 23	" 7	" 21	12	45	14	71
12	" 13	" 24	" 16	Feb. 3	12	53	18	83
13	" 14	" 26	" 15	" 2	12	50	18	80
14	" 15	" 25	" 9	Jan. 23	10	45	14	69
				Maxm.	14	55	20	89
				Minim.	10	45	14	9
				Average	12.3	50.4	17.5	80.2

The part played by the degree of ripeness of the fruit as a determining factor in the length of the period required for the completion of the life-cycle is even greater in the case of *C. punctata* than with *C. capitata*. Also the percentage of eggs which did not hatch, presumably on account of being deposited in insufficiently ripe fruit, seems to be somewhat higher in the case of the former. Therefore, if the cacao pods are picked just as soon as they ripen and not allowed to remain an unnecessary time on the trees, a large number of the maggots within the pods would not have sufficient time to reach their full growth, and the period during which the pods are exposed to the females for egg-laying would be shortened. By this means the number of the adults to infect the next crop would be materially reduced.

5. CACAO BEETLE.

(*Adoretus hirtellus* Castn.)

This beetle continues to make its presence known wherever cacao is grown. In one instance it has been sent in with the complaint that it was attacking coffee. In this case the coffee was being grown in the vicinity of cacao.

When attacking cacao from three to four years old, in no case known to me has this beetle defoliated the trees to such an extent as to seriously injure them. But when it attacks younger cacao it ruins the young leaves as quickly as they appear and sets back the trees considerably.

Laboratory experiments have been made to test the relative effectiveness of certain arsenicals. Twigs of cacao were sprayed with a fine syringe until the leaves began to drip and each twig was placed in a jar of water, the stem being put through a hole in the cover of the jar. After the spray had thoroughly dried twenty-three beetles were placed on each twig. A large envelope was then placed over each twig and kept in place by tying it to the jar. Observations were made daily. Jar No. 1 was sprayed with arsenate of lead at the rate of 3 lbs. to 50 gallons of water: jar No. 2 with arsenate of lime at the rate of 2 lbs. to 50 gallons of water: jar No. 3 with chromate of lead at the rate of 2 ozs. to 4 gallons of water: jar No. 4 with Paris Green at the rate of 1 lb. to 75 gallons of water: jar No. 5 was un-sprayed and used as a check.

TABLE IV.—SHOWING EFFECT OF CERTAIN ARSENICALS ON
A. HIRTELLUS.

Date of Spraying	Date of Examination	Number of beetles dying in each jar				
		I Arsenate of lead	II Arsenate of lime	III Chromate of lead	IV Paris Green	V Check on spray
22nd March 1913	March 24	5	2	8	12	- - -
	" 25	3	12	12	7	- - -
	" 26	12	3	2	- - -	- - -
	" 27	1	- - -	- - -	- - -	- - -
	" 28	- - -	- - -	- - -	- - -	2
	" 29	- - -	- - -	- - -	- - -	4
	" 30	- - -	- - -	- - -	- - -	- - -
Total number dead		21	17	22	20	6
Number of days required to kill		6	5	5	4	- - -

Apart from the killing value of these insecticides, Nos. 1 and 3, particularly 3, are especially good, as they withstand heavy rains remarkably well, whereas No. 4 does not.

6. UNINVESTIGATED PESTS.

Shortly before the end of the year two new pests of cacao were discovered: one is a beetle, *Xylelorus* sp. ?, which bores shot-like holes in the branches: the other is the larva of a moth which makes large tunnels in the trunk and larger branches. The adult of the latter species has not yet been obtained. It is under investigation and no further report on it will be given until that is complete.

82. INSECTS ATTACKING COTTON.

1. COTTON STAINERS

Dysdercus nigrofasciatus, Staal.

Dysdercus pretiosus, Dist.

Oxycarenus gossipinus, Dist.

Oxycarenus hyalipennis, Costa.

As usual these insects are plentiful. On one occasion I observed *D. pretiosus* being preyed on by the wasp, *Odynerus* (*Ancistocerus*) *gowdeyanus*, M. - Waldo (sp. nov.) and on two occasions by *Synagris cornuta* L. var. *ugandae* M. - Waldo (var. nov.) But, as both of these wasps are rather uncommon, much assistance cannot be expected from them.

2. BOLLWORM

(*Earias insulana*, Boisd.)

No report of damage being caused by this insect was received.

3. SCALE INSECTS

(*Pulvinaria jacksoni*, Newst.)

As hitherto, only isolated plants were found to be attacked by this scale insect. Several specimens of the parasite, *Tetra stichus gowdeyi*, Crawf., were bred from the female host.

83. INSECTS ATTACKING TEA.

1. SCALE INSECTS

(*Aspidiotus transparens*, Green.)

(*Ceroplastes ceriferus*, And.)

The former scale insect attacks the under surface of the older leaves and sometimes completely covers them. In the event of tea being grown on a large scale in this country, this insect will have to be reckoned with.

C. ceriferus has not been found on this food plant in sufficient quantities to be considered a serious pest.

THE COLLECTION OF INSECTS AND OTHER ANTHROPODS.

The collection of insects and other anthropods, both beneficial and harmful, has been increased considerably during the last year and it is now properly systematically arranged. Several new species, many of which, as in the case of the family *Coccidae*, are of economic importance.

TICKS (*Ixodidae*).

With the assistance of collectors the distribution of the ticks throughout the country is being worked out. Ticks play an important part economically in being agents in the transmission of infectious diseases and as external parasites on man and domesticated animals. At least six pathogenic micro-organisms thus transmitted by the agency of ticks are found in Uganda; one disease occurs in man and the remainder in domesticated animals.

As external parasites, ticks are of great importance on account of the considerable amount of blood removed from the host. Cases are on record of domesticated animals dying from acute anaemia on account of the amount of blood withdrawn by these ectoparasites. In the case of the *Rhipicephalinae*, which moult on the host, there is no long period of waiting before another host is found, but merely continue to suck blood from the same animal and as a result such ticks reproduce more rapidly and become of greater importance as external parasites than species which drop to moult and have to await the passing of another host. Certain species of the *Ixodidae*, notably *Amblyomma variegatum*, Fab, are of considerable importance as parasites on account of the fact that their long hypostome permits of deep penetration producing inflammation, which results in suppuration.

TABLE V—SHOWING TICKS COLLECTED AND DISEASES TRANSMITTED BY THEM.

Ticks	Common Name	Hosts	Disease transmitted	Organisms causing disease	Remarks
<i>Ornithodoros moubata</i> , Murray.	Spirrillum tick	Man	Human tick fever	Spirochaeta	Common in native huts and markets
<i>Rhipicephalus appendiculatus</i> , Neum.	Brown tick	Cattle, mule, dog, goat, sheep, horse, elephant, man	East Coast Fever, and Anaemia	Piroplasma parvum, P. Mutans	Very common
<i>Rhipicephalus capensis</i> , Koch.		Buffalo	East Coast Fever (?)	Piroplasma parvum	...
<i>Rhipicephalus dux</i> , Don.		Waterbuck	...	...	...
<i>Rhipicephalus evertsi</i> , Neum.	Red tick	Domesticated animals, reed-buck	Billiary Fever of horses, East Coast Fever	Piroplasma equi, P. parvum	...
<i>Rhipicephalus falcatus</i> , Neum.	...	Buffalo	...	...	...
<i>Rhipicephalus lunulatus</i> , Neum.	...	Bushbuck	...	...	...
<i>Rhipicephalus neavei</i> , Warb.	...	Buffalo	...	...	...
<i>Rhipicephalus sanguineus</i> , Latr.	...	Sheep	...	...	...
<i>Rhipicephalus simus</i> , Koch.	Black-pitted tick	Dog, sheep, goat, pig, cattle	East Coast Fever	Piroplasma parvum	...
<i>Rhipicephalus sulcatus</i> , Neum.	...	Reedbuck	...	...	...
<i>Boophilus annulatus</i> , var. <i>australis</i> Fuller.	Australian cattle tick	Cattle, buffalo	Redwater	Piroplasma bigeminum	...
<i>Boophilus annulatus</i> , var. <i>decoloratus</i> , Koch.	Blue tick	Cattle, mule, donkey, sheep, goat	Redwater and gall sickness	Piroplasma bigeminum & Anaplasma marginale	...
<i>Haemaphysalis hoodi</i> , Nutt.	...	...	...	...	...
<i>Haemaphysalis leachi</i> , Aud.	Dog tick	Dog, cat, cattle, jackal, warthog	Tick fever of dog	Piroplasma canis	Very common
<i>Dermacentor circumgnathus</i>	...	Elephant	...	...	...
<i>Dermacentor rhinocerotis</i> , de Geer.	Rhinoceros tick	Rhinoceros	...	...	...
<i>Aponoma exornatum</i> , Koch	Lizard tick	Varanus niloticus, python	...	...	...
<i>Amblyomma cohaerens</i> ,	...	Buffalo	...	+	...
<i>Amblyomma hebraeum</i> , Giebel.	...	Cattle, buffalo	...	...	...
<i>Amblyomma marmoresum</i> , Koch.	...	Puff adder	...	...	...
<i>Amblyomma petersi</i> ,	...	Rhinoceros	...	...	...
<i>Amblyomma sparsum</i> ,	...	Cattle, donkey, mule	...	...	...
<i>Amblyomma variegatum</i> , F.	Variegated tick	Cattle, goat, sheep, rhinoceros, dog	East Coast Fever (?)	...	Very common
<i>Amblyomma tholloni</i> , Neum.	...	Elephant	...	...	...

TABLE VI.—SHOWING UGANDA TICKS AND THEIR WILD HOSTS

WILD HOST	TICKS KNOWN TO TRANSMIT DISEASE TO DOMESTICATED ANIMALS								TICKS								DISEASE				TO DOMESTICATED ANIMALS.			
	Rhipicephalus appendiculatus	Rhipicephalus (evers)	Boophilus annulatus	Haemaphysalis leachi	Amblyomma variegatum	Rhipicephalus capensis	Rhipicephalus dux	Rhipicephalus falcatus	Rhipicephalus lunulatus	Rhipicephalus nervel	Rhipicephalus sulcatus	Dermacentor circum- gratatus	Dermacentor rhinocerotis	Amblyomma maritimum	Amblyomma exornatum	Amblyomma hebraeum	Amblyomma petersi	Amblyomma collei	Amblyomma tholloni					
Buffalo	-	-	X	-	X	X	-	X	-	X	-	-	-	-	-	X	-	X	-					
Bushbuck	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-					
Duiker	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	X					
Elephant	X	-	-	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-					
Jackal	-	-	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-					
Lizard (<i>Varanus</i> sp.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-					
Puff Adder	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-					
Python	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	X	-	-					
Reedbuck	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Rhino- ceros	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Situtunga	XO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Warthog	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Water- buck	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-					

o Form not typical.

86. DONATION OF INSECTS AND OTHER ANTHROPODS.

A larger number of insects and other Anthropods than hitherto were donated to the Imperial Bureau of Entomology, British Museum (Natural History). The donations, exclusive of the insects collected by other collectors, consisted of :—

Coleoptera	...	8334
Coccidae	...	41 spp.
Other Hemiptera		4089
Hymenoptera	...	2906
Orthoptera	...	1873
Diptera	...	1682
Lepidoptera	...	528
Euplexoptera	...	40
Odonata	...	2
Siphonaptera	...	14
Ephemera	...	6
Myrmelionidae	...	7
Ixodidae	...	73
Mallophaga	...	38
Araneida	...	6
Total		<u>19639</u>

87. FUMIGATION OF PLANTS AND SEEDS.

Since the prohibition of the importation of coffee plants and seeds, other than roasted and ground coffee for consumption, and the prohibition of the importation of plant life in any form from Ceylon, except with the permission of the Governor, the imports have considerably decreased. A table showing the imports for the year is given overleaf :—

88. TABLE VII.

Consignments	Countries of Origin										Total
	United Kingdom	British East Africa	Federated Malay States	Ceylon	France	German East Africa	Nigeria	West Indies	India	Nyasaland	
Vegetable Seeds ...	27	20	-	-	4	-	-	-	-	-	51
Ornamental Seeds and Plants ...	33	5	1	2	2	-	1	2	2	1	49
Para Rubber Seeds ...	-	-	-	100	-	-	-	-	-	-	100
Ceara Rubber Seeds ...	-	-	-	1	-	-	-	-	-	-	1
Bridelia Micrantha ...	-	-	-	-	-	1	-	-	-	-	1
Coffee ...	-	1x	-	-	-	-	-	-	-	-	1
Maize ...	-	1	-	-	-	-	-	-	-	-	1
Albizzia ...	-	1	-	-	-	-	-	-	-	-	1
Linseed ...	-	12	-	-	-	-	-	-	-	-	12
Sim Sim ...	-	5	-	-	-	-	-	-	-	-	5
Vanilla ...	-	-	1	-	-	-	-	-	-	-	1
Nippa ...	-	-	1	-	-	-	-	-	-	-	1
Eucalyptus ...	-	1	-	-	-	-	-	-	-	-	1
Black Wattle ...	-	1	-	-	-	-	-	-	-	-	1
Fruit Trees ...	1	1	-	-	-	-	-	-	-	-	2
Unclassified ...	4	4	-	-	-	-	-	-	-	-	8

X not allowed to enter.

89. PUBLICATIONS.

Two publications were issued during the year. The first was a bulletin "An Account of Insects Injurious to Economic Products and their Control," and the second an article "On the Utilisation of an Indigenous African Silkworm (*Anaphe infracta*, Walsm), in Uganda," published in the Bulletin of Entomological Research.

90. MYCOLOGY.

At the request of the Director of Agriculture this additional work was undertaken in August : but, in the absence of equipment and with but little time to devote to it, only the most pressing part of the work was touched.

The most important diseases which I reported were the coffee leaf disease, *Hemileia vastatrix*, Berk and Broome, and the leaf spot, *Gloeosporium* sp.? on tea. It is my opinion that the former disease, if not endemic, has been present in the country for several years and is apparently now becoming epidemic with the planting up of large areas in coffee, and that it escaped earlier detection as no attention has hitherto been paid to plant diseases.

C. C. GOWDEY, B. Sc., F.E.S., F.Z.S.

Government Entomologist.

ESTIMATED NUMBER OF LIVE STOCK IN THE PROTECTORATE.

Province	District	Horses	Mules	Donkeys	Horned Cattle	Sheep	Goats.
Buganda	Mengo	}	?	?	?	?	?
	Entebbe						
	Masaka	Nil	2	6	84,126	21,224	54,318
	Mubendi	Nil	9	6	7,161	5,103	30,040
Eastern	Busoga	2	5	41	51,106	12,809	77,464
	Bukedi	-	10	150	57,000	45,000	120,000
	Teso	1	1	-	116,000	42,000	83,000
	Lango	-	4	4	40,000	60,000	180,000
	Karomoja	?	?	?	?	?	?
	Lobor	-	?	?	?	?	?
Northern	Bunyoro	-	2	14	4,146	15,187	
	Gulu	-	2	24	?	?	?
	Nimule	-	2	3	3,000	50,000	
	Gondokoro	-	-	1	500	20,000	40,000
Western	Toro	-	5	6	45,670	32,667	60,845
	Ankole	1	10	2	330,000	275,000	440,000
	Kigesi	-	-	-	?	?	?
Rudolph	Turkwel	}	No	basis	for	an	estimate.
	Turkana						
	Dabossa						

APPENDIX 2.

NATIVE AGRICULTURE.

Province	District	Cotton	Groundnuts	Sim Sim	Plantains	Sweet Potatoes	Coffee	Rubber	Miscellaneous	Total Number of acres in crop	Uncultivated	
Buganda	Mengo } Entebbe } Masaka } Mubendi }	4,510	1,815	5,387	400,000	199,177	?	3,378	14,770	610,776	6,118,824	
		3,000	800	3	?	6,000	2,000	58	2,000	90,000	2,284,400	
		3,000	385	610	48,932	34,823	160	64	100	99,224	1,436,776	
		15,000	2,000	2,500	215,000	25,000	a little	7	Chillies	410,000	1,780,080	
Eastern	Busoga } Bukedi }	4,210	?	?	?	?	?	?	Rice	23,272	2,200,728	
		19,000	?	?	?	?	?	?	Linseed	250,000	2,200,560	
		1,200	?	?	?	?	-	-	?	336,000	2,918,400	
		?	?	?	?	?	?	?	?	?	?	
Northern	Bunyoro } Gulu } Nimule (Madi) } Gondokoro }	?	?	1,321	4,000	2,454	10	10	?	143,500	2,845,940	
		60	?	-	-	?	-	-	-	No record	240,000	696,960
		-	-	40,000	?	15,000	-	-	-	24,000	24,000	8,389,440
		?	6,000	?	?	?	-	-	-	?	?	?
Western	Toro } Ankole } Kigisi }	120	60	50	5,600	22,000	20	2	625	40,012	3,439,028	
		?	?	?	?	?	?	?	?	83,200	3,654,600	
Rudolph	Turkwel } Turkana } Dabossa }	No	basis	for	an	estimate.						

APPENDIX 3.

EUROPEAN CULTIVATION.

[illegible]

EUROPEAN CULTIVATION (cont.)

Province	Acreage of Cacao		Acreage of Ceara		Acreage of Castilloa & Coffee over 2 yrs.	Acreage of Castilloa	Acreage of Puntumia over 2 yrs.
	under 2 yrs.	over 2 yrs.	under 2 yrs.	over 2 yrs.			
Buganda	118½	153	670	372	2	78	47
Eastern	-	1 3	37	30			Acreage of Linseed 70

APPENDIX 4.

MISSION AGRICULTURE.

The various Missions working in the Country have large numbers of small patches under cultivation, totalling :—

475½ acres of Coffee,

219½ acres of Ceara Rubber,

122 acres of Para Rubber,

40 acres of Cacao, and

18 acres of Cotton.

COTTON GINNERIES.

The following table shews the machinery in use on the 31st March 1913 for dealing with the cotton crop.

Two more power ginneries are in course of erection, whilst seed cotton stores are to be found in various centres.

Particulars of machinery	Total
Power Roller Gins	99
„ Saw „	20
Hand Roller „	54
„ Saw „	28
Power Baling Presses	7
Hand „ „	5
Seed Openers	9
Delinters (2 being erected)	1
Oil Crushing Plant	1
Stores on Ginning Premises	15
Number of Factories	11
<i>KIND OF POWER:—</i>	
Steam.	4
Oil Engines	6
Suction Gas	1

REPORT ON THE EXAMINATION OF ALLEN COTTON FROM INDIVIDUAL PLANT SELECTIONS—SEASON 1912-1913.

Number of Plant	Description of Plant, Habit, Height, etc.	Insect pests	Fungoid Diseases	Number of bolls per plant	Maximum length of staple.	Regularity of length.	Percentage of Lint.	Strength.
1.	Recumbent, 5ft. high large basal branches, large pointed bolls, short internodes.	Free	Free	74	1 $\frac{3}{8}$	Regular	33.3	very strong
2.	Erect, 4 $\frac{1}{2}$ ft. high, short basal branches, large pointed bolls, short internodes.	Slight disease on bolls	"	45	1 $\frac{1}{2}$	"	30.5	"
3.	Recumbent, 5ft. high, large basal branches, large pointed bolls, short internodes.	Free	"	89	1 $\frac{1}{2}$	"	28	"
8.	Erect, 4 $\frac{1}{2}$ ft. high, large basal branches, large pointed bolls, short internodes.	"	"	46	1 $\frac{1}{2}$	Fairly "	30.5	"
9.	Erect, 4ft. high, short basal branches, large pointed bolls, short internodes.	"	"	47	1 $\frac{1}{2}$	Very "	28	"
13.	Erect, 4ft. high, short basal branches, large pointed bolls, short internodes.	"	"	57	1 $\frac{1}{2}$	Fairly "	28.4	"
17.	Erect, 6 $\frac{1}{2}$ ft. high, large basal branches, large pointed bolls, short internodes.	"	"	96	1-9/16	Very "	29.4	"
20.	Erect, 4 $\frac{1}{2}$ ft. high, short basal branches, large pointed bolls, short internodes.	"	"	67	1 $\frac{1}{2}$	"	32.2	"
22.	Recumbent, 4ft. high, large basal branches, small pointed bolls, short internodes.	"	"	63	1 $\frac{1}{2}$	"	30	"
25.	Recumbent, 6ft. high, large basal branches, large pointed bolls, short internodes.	"	"	90	1-7/16	"	30.5	"
29.	Recumbent, 4 $\frac{1}{2}$ ft. high, short basal branches, large pointed bolls, short internodes.	"	"	38	1 $\frac{1}{2}$	"	30	"
30.	Erect, 4 $\frac{1}{2}$ ft. high, large basal branches, large pointed bolls, short internodes.	Slight disease on bolls.	"	59	1 $\frac{1}{2}$	"	31.4	"
37.	Erect, 4 $\frac{1}{2}$ ft. high, large basal branches, large pointed bolls, short internodes.	Free	"	57	1 $\frac{1}{2}$	"	28.5	"
38.	Erect, 4ft. high, large basal branches, large pointed bolls, short internodes.	"	"	90	1 $\frac{3}{8}$	"	31.6	"
41.	Erect, 5ft. high, short basal branches, large pointed bolls, short internodes.	"	"	60	1 $\frac{1}{2}$	"	32.2	Fairly "
42.	Erect, 4ft. high, large basal branches, large pointed bolls, short internodes.	"	"	59	1 $\frac{1}{2}$	"	30.5	"

APPENDIX 7.

REPORT ON THE EXAMINATION OF SUNFLOWER COTTON FROM INDIVIDUAL PLANT SELECTIONS
SEASON 1911 — 1912.

Number of Plant	Maximum length of staple	Regularity	Proportion of Lint to Seed. Per cent.	Strength	Notes on Examination. Season 1912 — 1913.
	Inches				Transmitting power very good
1	1 $\frac{1}{2}$	Very	29	Very Strong	"
2	1 $\frac{1}{2}$	"	29	"	" fairly
3	1 $\frac{1}{2}$	"	30.4	"	"
4	1 $\frac{1}{2}$	"	30.4	"	" very 1 $\frac{1}{2}$ in. staples frequently found.
6	1-9/16	"	28.3	"	" fairly
7	1-7/16	"	28	"	"
8	1 $\frac{1}{2}$	"	31.6	"	"
9	1-7/16	"	31.6	"	"
11	1 $\frac{1}{2}$	"	31.6	"	"
12	1 $\frac{1}{2}$	"	27	"	"
13	1 $\frac{1}{2}$	"	25	"	" fairly
14	1-9/16	"	27	"	"
15	1-9/16	"	29	"	"
16	1 $\frac{1}{2}$	"	28	"	"
17	1 $\frac{1}{2}$	"	29	"	"
18	1-7/16	"	25	"	"
19	1 $\frac{1}{2}$	"	32.5	"	"
20	1 $\frac{1}{2}$	"	29	"	"
33	1 $\frac{1}{2}$	"	30	"	" very staple improved to 1 $\frac{1}{2}$ ins.
63	1 $\frac{1}{2}$	"	31.6	"	" " " "

The seed from the above selections will be used to sow 40 acres in the Plantation next season.

COMPARATIVE STATEMENT OF EXPORTS CONNECTED WITH AGRICULTURE

Articles	Unit	Year ended 31-3-09		Year ended 31-3-10		Year ended 31-3-11		Year ended 31-3-12		Year ended 31-3-13	
		Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£
Coffee	cwts	194	190	229	371	270	383	1,712	2,563	3,336	8,940
Chillies	"	2,489	725	9,638	7,417	17,462	20,492	13,643	16,658	10,599	12,408
Groundnuts	"	480	208	3,075	1,160	7,056	3,180	9,155	4,279	11,780	5,570
Ghee (Clarified Butter)	"	2,168	5,356	2,862	6,379	3,029	6,109	2,911	5,819	4,737	11,439
Jaggree (Unrefined Sugar)	"	345	305	257	200	330	263	289	226	319	301
Sim Sim Seed	"	6,719	2,717	14,159	5,431	10,589	4,477	13,855	7,048	31,402	16,812
Cotton Ginned	"	10,247	30,003	13,197	37,416	32,694	120,664	59,277	184,639	77,728	214,170
" Unginned	"	12,806	11,229	29,922	22,180	50,281	44,748	45,664	46,211	48,538	40,209
Cotton Seed	"	22,685	2,910	8,575	849	32,078	3,208	58,549	5,909	112,283	11,335
Beeswax	lbs	...	...	4,043	154	3,950	162	3,539	162	2,352	117
Hides	cwts	5,875	12,436	7,879	17,974	7,551	20,544	9,032	26,191	12,878	45,854
Rubber	"	426	6,366	945	14,121	898	13,412	277	4,117	243	3,647
" Plantation	lbs	...	...	...	...	552	147	2,102	325	4,474	834
Skins (Goats)	No.	607,103	21,486	727,294	27,482	664,430	24,920	581,615	22,249	573,852	28,543
" (Sheep)	"	97,053	2,581	95,885	1,748	95,160	1,771	77,964	1,559	83,989	1,940
" (Calf)	cwts	135	280	252	574	460	1,277	225	705	847	2,941
Miscellaneous	No.	1,428	138	2,280	146	...	1,278	...	4,979	...	7,994
Cotton Seed Cake	cwts	...	...	2,224	223	...	...	...	...	...	...
" Oil	galls.	...	...	4,155	330	13,088	1,322	3,213	3,776	583	716
Sim Sim Oil	"	?	7	2,078	226	3,263	355	...	...	7	12
Horses	No.	2	113	...	...	...	...	3	75	...	...
Mules	"	...	...	12	410	2	66	8	207	...	...
Donkeys	"	3	6	292	283	103	126	450	601	2	4
Cattle	"	...	...	...	...	...	...	382	1,144	1,516	6,205
Miscellaneous Live Stock	"	886	727	699	429	889	556	710	474	632	428
Miscellaneous	"	...	...	...	...	...	1,584	...	1,954	...	3,333
GRAND TOTAL			£97,783		£145,430		£271,044		£341,870		£423,752

APPENDIX 9.

COMPARATIVE STATEMENT OF IMPORTS
CONNECTED WITH AGRICULTURE

ARTICLES	Value Year ended 31-3-1909 £	Value Year ended 31-3-1910 £	Value Year ended 31-3-1911 £	Value Year ended 31-3-1912 £	Value Year ended 31-3-1913 £
Grain Wheat	19	36	24	56	23
„ Dhall	325	328	342	621	566
„ Maize	31	105	189	251	217
„ Rice	5,846	3,329	4,300	6,694	5,327
Other Kinds	1,615	1,269	1,770	648	980
Beans	21	34	529	78	128
Flour	6,302	5,652	6,556	7,848	7,812
Sugar	5,385	4,468	6,141	7,364	9,299
Coffee	310	118	148	319	404
Tea	1,385	1,313	1,508	2,307	3,381
Tobacco	2,859	3,368	5,097	6,208	8,520
Cigarettes	937	1,097	1,412	847	1,803
Cigars	326	284	352	541	300
Fruits & Vegetables	341	298	481	525	516
Timber	6,393	3,605	4,724	3,216	3,258
Hides and Skins	122	7	23	137	126
Rubber	1,530	9,262	8,618	1,586	2,799
Seeds and Plants	309	498	265	351	285
Cattle	1,223	191	101	48	...
Sheep and Goats	24	34	28	7	16
Horses	17	33	90	67	...
Donkeys	75	56	37	24	60
Mules	476	213	55	173	33
Miscellaneous Live Stock	28	87	12	115	39
Cotton Ginned	...	...	17	...	...
„ Unginned	...	...	2	...	165
TOTAL	35,899	35,679	42,821	40,031	46,047